CLAIMS

1. A method of producing an electronic device (1) comprising a plurality of electro-optical elements on a surface of a carrier (10), the method comprising the steps of:

- depositing a plurality of discrete droplets of a first liquid on the carrier surface, the first liquid comprising a mixture of a first electro-optical material (102) and a first polymer precursor (104); and
- forming the plurality of electro-optical elements by exposing the plurality of discrete droplets to a stimulus for polymerizing the polymer precursor (104) of a discrete droplet (100) of the first liquid into a discrete polymer layer (114) enclosing the first electro-optical material (102) of the discrete droplet (100) between said polymer layer (114) and the carrier surface.

2. A method as claimed in claim 1, wherein a discrete droplet (100) of the first liquid is formed by depositing a plurality of smaller droplets of the first liquid over a same respective part of the electrode structure (12).

3. A method as claimed in claim 1 or 2, wherein the step of depositing a plurality of discrete droplets is preceded by modifying the carrier surface by depositing an electrode structure (12) on the carrier surface.

4. A method as claimed in claim 1, 2 or 3, wherein the step of depositing a plurality of discrete droplets is preceded by modifying the carrier surface by depositing an orientation layer (16) on the carrier surface.

5. A method as claimed in any of the claims 1-4, wherein the step of depositing the plurality of discrete droplets is preceded by the step of depositing a pattern of wall structures (202) on the carrier surface for creating

a plurality of bordered domains on the carrier surface, a droplet (100) from the plurality of discrete droplets being deposited in such a bordered domain.

6. A method as claimed in any of the claims 1-4, wherein the step of depositing a plurality of discrete droplets is preceded by the step of depositing a plurality of regions (302) of a nonwetting material on the carrier surface.

7. A method as claimed in claim 6, wherein, before depositing the plurality of discrete droplets, the substrate carrier surface is provided with a plurality of first regions functionalized for selective accumulation of polymer material and a plurality of second regions functionalized for selective accumulation of the electro-optical material (102), respective first regions being provided between respective second regions and respective regions (302) of a non-wetting material.

8. A method as claimed in any of the preceding claims, wherein the first electro-optical material (102) comprises a liquid crystal material.

9. A method as claimed in any of the preceding claims, wherein the first liquid comprises a first colorant which, during formation of the plurality of electro-optical elements, selectively accumulates in the polymer layer.

10. A method as claimed in claim 9, wherein the first colorant is functionalized with reactive groups adapted to react with the first polymer precursor during formation of the plurality of electro-optical elements.

11. A method as claimed in claim 10, wherein the first colorant is (co-) polymerizable to form a polymer of the discrete polymer layer.

12. A method as claimed in any of the preceding claims, further comprising the steps of:

- depositing a plurality of discrete droplets of a second liquid on the carrier surface, the second liquid comprising a mixture of a second

electro-optical material (122) and a second polymer precursor (124); and

- forming a further plurality of electro-optical elements by exposing the plurality of discrete droplets of the second liquid to a second stimulus for polymerizing the second polymer precursor (124) into a further discrete polymer layer (134) enclosing the second electro-optical material (122) between said further polymer layer (134) and the carrier surface.

13. A method as claimed in claim 12, wherein the step of depositing a plurality of discrete droplets of a first liquid on the carrier surface and the step of depositing a plurality of discrete droplets of a second liquid on the carrier surface are executed substantially in parallel.

14. A method as claimed in any of the preceding claims, wherein the second electro-optical material (122) comprises a further liquid crystal material.

15. A method as claimed in any one of the claims 12, 13 or 14, wherein the second liquid comprises a second colorant which, during formation of the plurality of electro-optical elements, selectively accumulates in the further polymer layer and has a color which is different from that of the first colorant.

16. A method as claimed in claim 15, wherein the second colorant is functionalized with reactive groups adapted to react with the second polymer precursor during formation of the plurality of electro-optical elements.

17. A method as claimed in claim 16, wherein the second colorant is (co-) polymerizable to form a polymer of the further polymer layer.

18. A method as claimed in any of the preceding claims, further comprising the step of depositing a further electrode structure (3) on a polymer layer (114, 134, 154) of the plurality of electro-optical elements.

19. A method as claimed in of the preceding claims, further comprising the step of covering the plurality of electro-optical elements with a light reflecting coating.

20. A method as claimed in any of the preceding claims, the method further comprising the step of adding a light-polarizing layer (14) to the carrier (10), the light-polarizing layer (14) being arranged substantially parallel to the carrier surface.

21. A method as claimed in any of the preceding claims, further comprising the step of covering the plurality of electro-optical elements with a planarization layer (24).

22. A method as claimed in any of the preceding claims, further comprising the step of providing a further surface of the carrier with an adhesive layer.

23. A method of producing an electronic device (700) comprising a display area (722, 724) on a part of a surface of a carrier (10) carrying an electrode structure (12), the method comprising the steps of:

- dripping a first liquid on the part (722, 724) of the carrier surface, the first liquid comprising a mixture of a first electro-optical material (102) and a first polymer precursor (104);

and

- forming the display area by exposing the first liquid to a stimulus for polymerizing the polymer precursor (104) into a discrete polymer layer (114) enclosing the first electro-optical material (102) between said polymer layer (114) and the carrier surface.

24. A method as claimed in claim 23, further comprising the step of bordering the part (722, 724) of the carrier surface with a dewetting material prior to the dripping of the first liquid on the part of the carrier surface.

25. A method as claimed in claim 23 or 24, further comprising the step of providing a further surface of the carrier (10) with an adhesive layer (750).

26. A method as claimed in claim 25, further comprising the step of integrating a power supply into the carrier (10).

27. A method as claimed in claim 25, further comprising the step of providing the further surface with a conductive contact, the conductive contact being conductively coupled to the electrode structure (12).

28. An electronic device (1) comprising:
a carrier (10) having a surface; and
a plurality of electro-optical elements positioned on the carrier surface, each of the electro-optical elements (110) comprising a discrete polymer layer (114) enclosing a first electro-optical material (102) between said polymer layer (114) and the carrier surface.

29. An electronic device (1) as claimed in claim 28, wherein the carrier surface comprises an electrode structure (12).

30. An electronic device (1) as claimed in claim 28 or 29, wherein the carrier surface comprises an orientation layer (16).

31. An electronic device (1) as claimed in claim 28, 29 or 30, wherein the electronic device further comprises a pattern of wall structures (202) for creating a plurality of bordered domains on the carrier surface; an electro-optical element (110) from at least a part of the plurality of electro-optical elements occupying such a bordered domain.

32. An electronic device (1) as claimed in claim 28, 29 or 30, wherein the plurality of electro-optical elements are separated from each other by means of nonwetting regions (302) on the carrier surface.

33. An electronic device (1) as claimed in claim 32 wherein the substrate carrier surface is provided with a plurality of first regions functionalized for selective accumulation of polymer material and a plurality of second regions functionalized for selective accumulation of the electro-optical material (102), respective first regions being provided between respective second regions and respective regions (302) of a non-wetting material.

34. An electronic device (1) as claimed in any of the claims 29-33, wherein the first electro-optical material (102) comprises a liquid crystal material.

35. An electronic device (1) as claimed in any of the claims 29-33, wherein the discrete polymer layer (114) comprises a first colorant.

36. An electronic device (1) as claimed in claim 35 wherein the first colorant is chemically bonded to a polymer of the discrete polymer layer.

37. An electronic device (1) as claimed in claim 36 wherein the first colorant is (co-)polymerized to form a polymer of the discrete polymer layer.

38. An electronic device (1) as claimed in any of the claims 32-37, the electronic device further comprising a plurality of further electro-optical elements positioned over further respective parts of the electrode structure (12), each of the further electro-optical elements (130) comprising a further discrete polymer layer (134) enclosing a second electro-optical material (122) between said second layer (134) and the carrier surface.

39. An electronic device (1) as claimed in any of the claims 32-38, wherein the second electro-optical material (122) comprises a further liquid crystal material.

40. An electronic device (1) as claimed in any of the claims 38-39, wherein the further discrete polymer layer (134) comprises a second colorant having a color different from that of the first colorant.

41. An electronic device (1) as claimed in claim 40 wherein the second colorant is chemically bonded to a polymer of the further discrete polymer layer.

42. An electronic device (1) as claimed in claim 41 wherein the second colorant is (co-)polymerized to form a polymer of the further discrete polymer layer.

43. An electronic device (1) as claimed in any of the claims 35-42, wherein the plurality of electro-optical elements carry a further electrode structure (32).

44. An electronic device (1) as claimed in any of the claims 35-43, wherein the plurality of electro-optical elements are covered by a light reflecting coating.

45. An electronic device (1) as claimed in any of the claims 35-44, wherein the carrier comprises a light-polarizing layer.

46. An electronic device (1) as claimed in any of the claims 35-45, wherein the plurality of electro-optical elements is covered by a planarization layer (24).

47. An electronic device (1) as claimed in any of the claims 35-46, wherein the carrier (10) is flexible.

48. An electronic device (1) as claimed in any of the claims 35-47, wherein the plurality of electro-optical elements are covering a predefined part of the carrier surface.

49. An electronic device (1) as claimed in any of the claims 35-48, wherein the electronic device is a display device.

50. An electronic device as claimed in any of the claims 35-49, wherein a further surface of the carrier carries an adhesive layer.

51. An apparatus (600) for producing an electronic device (1) comprising a plurality of electro-optical elements on a surface of a carrier (10), the apparatus (600) comprising:

receiving means (620) for receiving the carrier (10); and

depositing means (640; 641; 642) for depositing a plurality of discrete droplets of a liquid on the carrier surface (12), the liquid comprising a mixture of an electro-optical material (102) and a polymer precursor (104), the depositing means (640; 641; 642) being arranged opposite the receiving means (620) with at least one of the receiving means (620) and the depositing means (640; 641; 642) comprising mechanical translation means for changing an orientation of the depositing means (640; 641; 642) from over a first part of the carrier surface to an orientation over a second part of the carrier surface.

52. An apparatus (600) as claimed in claim 51, the apparatus (600) further comprising means for forming the plurality of electro-optical elements by exposing the plurality of discrete droplets to a stimulus for polymerizing the polymer precursor (104) of a discrete droplet (100) of the liquid into a discrete polymer layer (114) enclosing the electro-optical material (102) of the discrete droplet (100) between said polymer layer (114) and the carrier surface.

53. An apparatus (600) as claimed in claim 51 or 52, wherein the depositing means (640; 641; 642) comprise a printing head (641) having a plurality of nozzles (642).

54. An apparatus (600) as claimed in claim 53, wherein a first subset of the plurality of nozzles (642) is coupled to a reservoir for containing a first liquid comprising a mixture of a first electro-optical material (102) and a first polymer precursor (104) and a second subset of the plurality of nozzles (642) is coupled to a reservoir for containing a second liquid comprising a mixture of a second electro-optical material (122) and a second polymer precursor (124).